AMENDMENTS TO THE CLAIMS

Claim 1 (Original) A method for fabricating a tridimensional solid object by sintering inorganic particles with a controlled size distribution, characterized in that at least one powdery stream of the said particles and at least one heating flux are simultaneously directed onto a rigid target area while an at least bidimensional relative movement is maintained between the target area, the powdery stream and the heating flux, where:
— the powdery stream is contained in a conical surface having as its axis (Z) the direction of the heating flux and its vertex (P) onto said target area, and
— the width of the heating flux is correlated to the dimensional distribution of the particles in the powdery stream, so that the width of the heating flux on the target area is not smaller than the majority in weight of the particles size distribution, with the result that the particles sinterization occurs in a single operation directly onto the target area.

Claim 2 (Original) A method for fabricating a tridimensional solid object according to claim 1, characterized in that the vertex angle (a) of the conical surface formed by said powdery stream does not exceed 45°.

Claim 3 (Original) A method for fabricating a tridimensional solid object according to claim 1, characterized in that the width of the heating flux onto the target area does not exceed 150 μm.

Claim 4 (Currently Amended) A method for fabricating a tridimensional solid object according to claim 1 ~~or 2~~, characterized in that the dimensional distribution of the particles is such that about 90% in weight of the particles have a size comprised in the range 0.5 to μm and the width of the heating flux does not exceed 20 μm.

Claim 5 (Original) A method for fabricating a tridimensional solid object according to claim 4, characterized in that said particles consist of agglomerated cristallites of a size lower than 10^{-7} m and are mixed in the powdery stream with least one carrier gas so as to constitute a solid aerosol.

Claim 6 (Currently Amended) A method for fabricating a tridimensional solid object according to ~~any of the preceding claims~~ claim 1, characterized in that said particles, in selectable different powdery 30 streams, are formed by different materials or phases.

Claim 7 (Original) A method for fabricating a tridimensional solid object according to claim 6, where said particles are formed by at least two phases, characterized in that a first phase does not exceed 85% in volume of the powdery stream while the sum of the other phases is at least 15% in volume of the stream and has a melting temperature in °C lower than 80% of the melting temperature of said first phase.

Claim 8 (Currently Amended) A method for fabricating a tridimensional solid object according to ~~any of the preceding claims~~ claim 1, characterized in that the powdery stream is directed onto the target area at a speed not exceeding 20 m/s.

Claim 9 (Currently Amended) A method for fabricating a tridimensional solid object according to ~~any of the preceding claims~~ claim 1, characterized in that the target area comprises a rigid substrate (S) positioned in a forming chamber (12) where is maintained a controlled atmosphere with an oxygen contents not exceeding 100 ppm.

Claim 10 (Currently Amended) A method for fabricating a tridimensional solid object according to ~~any of the preceding claims~~ claim 1, characterized in that to be entirely controlled by a CAD/CAM system.

Claim 11 (Currently Amended) A method for fabricating a tridimensional solid object according to ~~any of the preceding claims~~ claim 1, characterized in that the heating flux consists of a cone-shaped laser beam (LB) having a vertex angle (8) lesser than the vertex angle (a) of the conical surface formed by said powdery stream.

Claim 12 (Currently Amended) A method for fabricating a tridimensional solid object according to ~~any of the claims 1 to 10~~ claim 1, characterized in that the heating

flux is generated either by an electromagnetic induction coil arranged coaxially to the powdery stream or by a radiant heat generator, such as an infrared heater, or by an electron beam or by a microwave generator.

Claim 13 (Currently Amended) A method for fabricating a tridimensional solid object according to ~~any of the preceding claims~~ claim 1, characterized in that it comprises a possible final step consisting of an isostatic compacting at high temperature.

Claim 14 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles with a controlled size distribution and implementing the method of ~~any of the claims 1 to 13~~ claim 1, comprising a rigid target area, means generating at least one powdery stream of inorganic solid particles with a controlled dimensional distribution and means generating a correlated heating flux, characterized in that the means generating a powdery stream comprise a device (30) formed by a first and a second cones (31, 32), said cones having their axis (Z) in common with the heating flux, and in that the apparatus includes driving means for providing an at least bidimensional relative motion between the target area, the device (30) generating the powdery stream and the heating flux, whereby the particles of the powdery stream are directly heated by said healing flux onto the target area.

Claim 15 (Original) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles according to claim 14, characterized in that said device (30) generating the powdery stream comprises an annular gap (33) between said cones (31, 32) and said cones are connected to one another in sucha way that the width of the gap is adjustable, preferably in the range 0.1 to 0 8 mm.

Claim 16 (Original) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles according to claim 15, characterized in that the conical surface formed by said powdery stream has a vertex angle (cc) not exceeding 45°.

Claim 17 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles with a controlled size distribution, and implementing the method of ~~any of the claims 1 to 13~~ claim 1, comprising a rigid target area, means generating at least one powdery stream of inorganic solid particles of a controlled dimensional distribution and means generating a correlated heating flux, characterized in that the means generating a powdery stream consist of a plurality of rectilinear pipes (75) having their axis (Ti, T2,...) inclined at the same angle (α) with respect to the axis (Z) of the rectilinear heating flux, in such a manner that the powdery stream is in the shape of a conical surface coaxial with the heating flux and in that the apparatus includes driving means for providing an at least bidimensional relative motion between the target area, the rectilinear pipes (75) andr the heating flux, whereby the particles of the powdery stream are directly heated by said heating flux onto the target area.

Claim 18 (Original) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to claim 17, characterized in that the angle (α) of the axis (Ti, T2,...) of the pipes (75) with respect to the heating flux is adjustable but not exceeding 45°.

Claim 19 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to ~~any of the claims 14 to 18~~ claim 14, characterized in that it comprises an emitter (40) of a laser beam (LB) as means generating said heating flux, the emitter being associated to known pointing means (47).

Claim 20 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to ~~any of the claims 14 to 18~~ claim 14, characterized in that it comprises an electromagnetic induction coil arranged as means generating said heating flux.

Claim 21 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to ~~any of the claims 14 to 18~~ claim 14, characterized in that it comprises an infrared heat generator or an electron beam or a microwave generator as means generating said heating flux.

Claim 22 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to ~~any of the claims 14 to 21~~ claim 14, characterized in that it comprises a per se known device comprising a rotary brush (36), an element (41) for the elastic deformation of said brush (36) and supplied with a carrier gas in order to feed the powdery stream to the forming chamber as a solid aerosol (PA).

Claim 23 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to ~~any of the claims 14 to 22~~ claim 14, characterized in that it comprises ultrasonic means to keep vibrating the means generating the powdery stream.

Claim 24 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to ~~any of the claims 14 to 23~~ claim 14, characterized in that the target area is on a rigid base (16) in the interior of a forming chamber (12) and preferably consists of a substrate (S) arranged in a recess (16A) of said base (16).

Claim 25 (Original) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to claim 24, characterized in that a controlled atmosphere is maintained in said forming chamber (12), which is preferably provided with a fitting (19) for the connection to a vacuum pump.

Claim 26 (Original) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to claim 25,

characterized in that it comprises a device (70) for controlling the oxygen contents in the forming chamber (10) so that it does not exceed a maximum velue of 100 ppm.

Claim 27 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to ~~any of the claims 14 to 26~~ claim 14, characterized in that the temperature at the target area (11) is monitored by per se 30 known measuring instruments, preferably including a pyrometer (80) aimed at the target area and an associated control box (85).

Claim 28 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to ~~any of the claims 14 to 27~~ claim 14, characterized in that it comprises a a device (65), for example a high resolution CCD camera, for an on-line shape and thickness control of the object fabricated.

Claim 29 (Currently Amended) An apparatus for fabricating a tridimensional solid object by sintering inorganic particles of controlled size distribution according to ~~any of the claims 14 to 28~~ claim 14, characterized by integrating and using multiple widths of the heating flux and different means generating powder streams powder in order to vary the dimentional precision of the fabricated object, even in the various portions thereof.

Claim 30 (Currently Amended) Tridimensional objects fabricated from inorganic particles of controlled size distribution by the method of ~~any~~ claim 1 ~~to 13 and/or by the apparatus of any claim 14 to 29~~.

Claim 31 (New) Tridimensional objects fabricated from inorganic particles of controlled size distribution by the apparatus of claim 14.